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EXAMINER

FULLER, BRYAN A

ART UNIT PAPER NUMBER

3672

DATE MAILED: 05/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/612,271

Applicant(s)

DALRYMPLE ET AL.

Examiner

Bryan A. Fuller

Art Unit

3672

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☐ Claim(s) 1 - 18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 7/2/03, 9/7/04 (4).
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

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## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 1 is objected to because of the following informalities: Claim 1(a) refers to a "hydrophobically-modified RPM." This is a very common acronym typically used for revolutions per minute. This objection can be overcome if the acronym, RPM, was in parentheses and the words it stands for specifically used in claim 1. This would not be necessary in the subsequent claims. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 – 10, 14, 15, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Weaver et al (4,532,052).

With respect to claims 1 and 2: Weaver et al teaches in column 5, lines 1 – 61 and column 20, line 65 – column 21, line 48 a method of stimulating a subterranean formation by introducing an aqueous fluid containing a hydrophobically-modified polymer and also introducing an acidizing fluid. The hydrophobically-modified polymer is a reaction product of various hydrophilic and hydrophobic polymers.

With respect to claim 3: Weaver et al teaches in column 14, lines 52 – 59 a hydrophilic polymer containing reactive amino groups in the polymer backbone or as pendant groups.

With respect to claim 4: Weaver et al teaches in column 11, lines 61 – 66 that the hydrophilic polymer can be a homopolymer or copolymer.

With respect to claims 5 – 7 and 9 - 10: Weaver et al teaches in column 19, line 67 – column 20, line 29 polymers with dialkyl amino pendant groups and alkyl acrylate polymers. More specifically, the reference teaches the use of dimethylaminoethyl methacrylate (DMAEMA), which is a monomer that contains a dimethyl amino pendant group. The reference also includes the polymers containing the previously described monomers.

With respect to claim 8: Weaver et al teaches in column 32, lines 12 – 15 the use of polyethyleneimine as the polymer.

With respect to claim 14: Weaver et al teaches in column 20, line 68 – column 21, line 13 that the hydrophobically-modified polymer is dissolved in an aqueous solution and then injected into the formation.

With respect to claim 15: Weaver et al teaches in column 10, lines 33 – 36 that the hydrophobically-modified polymer, made of the hydrophilic polymer and the hydrophobic compound, can be formed in situ.

With respect to claim 18: Weaver et al teaches in column 22, lines 14 – 36 the use of a surfactant to promote the above mentioned method.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 – 10, 14, 15, and 18 are also rejected under 35 U.S.C. 103(a) as being unpatentable over Card et al (5,979,557) in view of Weaver et al.

With respect to claim 1: Card et al teaches in column 4, lines 40 – 52 a method comprising: step for selectively blocking the pore structure in the water-bearing zone at the formation face to selectively retard migration of acid into the water-bearing zone and allow migration into the hydrocarbon zone: and injecting acid into the formation, wherein the acid is diverted from the water-bearing zone to the hydrocarbon zone as a result of selectively blocking the pore structure in the water-bearing zone at the formation face. Weaver et al teaches the features as previously described and the improvement of fluids used to reduce the flow of aqueous fluids into or out of the formations. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Card et al in view of Weaver et al and introduce a hydrophobically-modified polymer and introduce an acid to stimulate a subterranean formation.

With respect to claim 2: Card et al teaches the features as previously described. Weaver et al teaches in column 5, lines 54 – 61 the reaction product of a hydrophilic polymer and a hydrophobic compound. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Card et al in view of Weaver et al and introduce a hydrophobically-modified polymer, which is the reaction product of a hydrophilic polymer and a hydrophobic compound.

With respect to claim 3: Card et al teaches the features as previously described. Weaver et al teaches in column 14, lines 52 – 59 a hydrophilic polymer containing reactive amino groups in the polymer backbone or as pendant groups. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Card et al in view of Weaver et al and introduce a hydrophobically-modified polymer containing reactive amino groups in the polymer backbone or as pendant groups.

With respect to claim 4: Card et al teaches the features as previously described. Weaver et al teaches in column 11, lines 61 – 66 that the hydrophilic polymer can be a homopolymer or copolymer. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Card et al in view of Weaver et al and use a hydrophilic polymer that can be a homopolymer or copolymer.

With respect to claims 5 – 7 and 9 - 10: Card et al teaches the features as previously described. Weaver et al teaches in column 19, line 67 – column 20, line 29 polymers with dialkyl amino pendant groups and alkyl acrylate polymers. More specifically, the reference teaches the use of dimethylaminoethyl methacrylate (DMAEMA), which is a monomer that contains a dimethyl amino pendant group. The reference also includes the polymers containing the previously described monomers. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Card et al in view of Weaver et al and use a hydrophilic polymer with dialkyl amino pendant groups and alkyl acrylate polymers, as dimethylaminoethyl methacrylate (DMAEMA), which is a monomer that contains a

Art Unit: 3672

dimethyl amino pendant group, or with polymers containing the previously described monomers.

With respect to claim 8: Card et al teaches the features as previously described. Weaver et al teaches in column 32, lines 12 – 15 the use of polyethyleneimine as the polymer. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Card et al in view of Weaver et al and use polyethyleneimine as the hydrophilic polymer.

With respect to claim 14: Card et al teaches the features as previously described. Weaver et al teaches in column 20, line 68 – column 21, line 13 that the hydrophobically-modified polymer is dissolved in an aqueous solution and then injected into the formation. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Card et al in view of Weaver et al and dissolve the hydrophobically-modified polymer in an aqueous solution and then inject into the formation.

With respect to claim 15: Card et al teaches the features as previously described. Weaver et al teaches in column 10, lines 33 – 36 that the hydrophobically-modified polymer, made of the hydrophilic polymer and the hydrophobic compound, can be formed in situ. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Card et al in view of Weaver et al and form the hydrophobically-modified polymer in situ.

With respect to claim 18: Card et al teaches the features as previously described. Weaver et al teaches in column 22, lines 14 – 36 the use of a surfactant to

Art Unit: 3672

promote the above mentioned method. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Card et al in view of Weaver et al and use a surfactant to promote the formation of the hydrophobically-modified polymer in situ.

6. Claims 11 – 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weaver et al in view of Szabo et al (3,744,566).

With respect to claims 11 – 13: Weaver et al teaches the features as previously described. Additionally, Weaver et al teaches in column 15, lines 33 – 40 the use of alkyl halide as a reactive site to react with other reactive sites. Szabo et al teaches in column 3, line 35 – column 4, line 23 a hydrophobic compound that is an alkyl halide having an alkyl chain length of one to 16 carbon atoms capable of quarternizing a homopolymer of dimethylaminoethyl methacrylate (DMAEMA). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Weaver et al in view of Szabo et al and use an alkyl halide having an alkyl chain length of 6 to 22 carbons that is capable of quarternizing DMAEMA. The resistance factors obtained with these polymers were higher than those obtained with conventional RPMs.

7. Claims 11 – 13 can also be rejected under 35 U.S.C. 103(a) as being unpatentable over Card et al in view of Weaver et al as applied to claim 3 above, and further in view of Szabo et al.

With respect to claims 11 – 13: Card et al teaches the features as previously described. Weaver et al teaches the features as previously described. Additionally,



Art Unit: 3672

Weaver et al teaches in column 15, lines 33 – 40 the use of alkyl halide as a reactive site to react with other reactive sites. Szabo et al teaches in column 3, line 35 – column 4, line 23 a hydrophobic compound that is an alkyl halide having an alkyl chain length of one to 16 carbon atoms capable of quarternizing a homopolymer of dimethylaminoethyl methacrylate (DMAEMA). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the combination of Card et al and Weaver et al in view of Szabo et al and use an alkyl halide having an alkyl chain length of 6 to 22 carbons that is capable of quarternizing DMAEMA.

8. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weaver et al in view of Stahl et al (5,382,371).

With respect to claims 16 & 17: Weaver et al teaches the features as previously described. Stahl et al teaches in column 5, lines 52 – 62 a process for preparing the inventive polymers (the hydrophilic and hydrophobic compounds) by carrying out the polymerization in a polymerization medium, water, using monomer concentrations ranging from the minimum required to produce a polymer solution of the desired viscosity. The range given was from 0.1 weight percent up to 80 weight percent. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Weaver et al in view of Stahl et al and use the ranges disclosed in the inventor's application.

9. Claims 16 & 17 are also rejected under 35 U.S.C. 103(a) as being unpatentable over Card et al in view of Weaver et al as applied to claim 15 above, and further in view of Stahl et al.


Art Unit: 3672

With respect to claims 16 & 17: Card et al teaches the features as previously described. Weaver et al teaches the features as previously described. Stahl et al teaches in column 5, lines 52 – 62 a process for preparing the inventive polymers (the hydrophilic and hydrophobic compounds) by carrying out the polymerization in a polymerization medium, water, using monomer concentrations ranging from the minimum required to produce a polymer solution of the desired viscosity. The range given was from 0.1 weight percent up to 80 weight percent. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the combination of Card et al and Weaver et al in view of Stahl et al and use the ranges disclosed in the inventor's application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bryan A. Fuller whose telephone number is (571) 272-8119. The examiner can normally be reached on M - Th 7:30 - 5:00 and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David J. Bagnell can be reached on (571) 272-6999. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
David J. Bagnell  
Supervisory Patent Examiner  
Art Unit 3672

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